5 DIGITAL IMAGE ANALYSIS

5.1 Purpose

This document contains the procedures for the analysis of digital images and/or video streams in order to improve the detail in all, or specific portions of, the images and/or video streams. The application of digital techniques primarily serves to increase the number of operations that may be attempted.

5.2 Equipment and Materials

The following equipment and materials may be used

- Computer hardware and software
- Video monitors
- Video players/recorders
- Various printers with appropriate output media
- Media to store digital images and/or video streams

5.3 Procedures

5.3.1 The desired image or video stream file will be opened in the appropriate software program.

5.3.2 A working copy of the file will be created.

5.3.3 The image or video stream will processed as necessary to maximize its quality. All processing steps will be documented in the order in which they are performed either in the examiner's notes or within the computer program. The processing steps used will vary in sequence and intensity due to the quality of the original image or video stream and the examiner's discretion.

Note: The most typical operations conducted on images or video streams include, but not limited to

- Brightness and contrast adjustments
- Conversion to grayscale
- Histogram equalization
- Sharpening
- Frame averaging
- Noise reduction by various methods

5.3.4 The final image or video stream will be saved under the appropriate file number to a .TIFF file format or other lossless compression format.

5.3.5 The final image will be printed labeled and returned with the original submitted evidence. Final video streams will be output to a video tape and/or some form of digital media, i.e. compact disc (CD), digital video disc (DVD), and returned with the original submitted evidence.

5.4 Calibration

Calibration procedures and scheduled maintenance for all equipment will be done in accordance with manufacturers' recommendations and recorded in the maintenance log located in the appropriate laboratory.

5.5 Calculations

Numerous mathematical calculations are included in the digitization and analysis processes. These include, but are not limited

to, Fast Fourier Transformations, bi-linear interpolation, spectral analysis and frame averaging. Most of these calculations are intrinsic to the software and are considered proprietary information.

5.6 Limitations

It must be recognized that the greatest limitation of the enhancement process is the quality of the submitted evidence.

5.7 Safety

Care should be taken to avoid circuit overload and injury when using electrical equipment. Gloves should be worn to handle any potentially bio-hazardous evidence.

5.8 References

Owner's Manuals and User's Manuals should be referenced for equipment operating instructions.

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